REMARKS

OBJECTION TO ABSTRACT OF DISCLOSURE

The Examiner objects to the abstract of the disclosure because it contains language that can be implied. Accordingly, the Applicant submits the above amendment to correct the content of the abstract.

Attached hereto is a marked-up version of the changes made to the specification by the current amendment. The attached page is captioned "*Version with markings to show changes made.*"

REJECTION UNDER 35 U.S.C. § 103(A)

Claims 1-10 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Holmes (U.S. Patent 5,497,451).

Holmes teaches a method relating to a pre-processing stage in a finite element analysis (Holmes, Column 10, lines 45-50). The method is used to define finite elements in a surface or volume in a computerized process (Holmes abstract).

First, Holmes is silent on providing an image of the object, as claimed by the Applicant. The Examiner cites to the Holmes disclosure at column 11, lines 10-18, but no image is mentioned or implied. In fact, the Holmes method is initiated on a given geometric model of the object under analysis (Holmes, Column 2, lines 33-38). There is no suggestion or teaching anywhere in Holmes of the acquisition of an image of the object upon which the method of the invention, as claimed by Applicant, is operated.

Second, the Examiner admits that Holmes is silent on providing a rough geometric description model, as claimed by the Applicant. The Examiner suggests that Holmes sub-divisions of smaller sub-surfaces can be regarded as a "rough" model of the surface. This sense of "rough" is opposite to Applicants sense of the term in that the rough model claimed by Applicant can be described as a geometric shape, or outline. By contrast, the Holmes "rough model" includes a plurality of sub-surfaces.

Third, Holmes does not extract sub-models from the rough geometric model as claimed by Applicant. Holmes decomposes a surface into sub-surfaces so that it forms a mesh over the entire surface. By contrast, the sub-models extracted in the method claimed by Applicant cover only portions of the rough model that may be defined by the user or client. Thus, a finite element

analysis decomposing a surface into sub-surfaces, as disclosed in Holmes, teaches away from the method claimed by Applicant.

Finally, Holmes does not teach or suggest finding poses of sub-models in the image, as claimed by Applicant. In fact, Holmes is silent on the application of any search algorithms in a machine vision analysis of an image. Instead, the Examiner cites the Holmes disclosure for its sequential testing operation to find, or optimize, the properties of sub-surface elements.

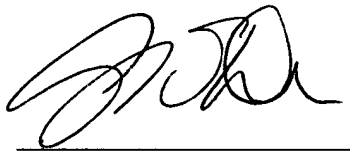
Accordingly, the rejection of claim 1 under 35 U.S.C. § 103(a) is deemed to be overcome.

The above arguments apply to claims 2-9, given that they are dependent on claim 1, and apply to independent claim 10 as well.

CONCLUSION

In view of the above remarks, Applicant respectfully requests withdrawal of all rejections, and allowance of the claims pending in the application. The Examiner is invited to telephone the undersigned Applicant's Attorney to facilitate advancement of the present Application.

Respectfully submitted,



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VERSION WITH MARKINGS SHOWING CHANGE

ABSTRACT

~~A method is disclosed for creating a refined geometric description (GD) of an object from an image of the object and a rough GD model of the object. The rough GD model of the object is provided, for example, by manually drawing a graphical depiction of the object on top of its image, using a GUI, for example, and/or by using CAD data. Next, the rough GD model is refined such that it more closely fits an instance of the object in the image. In preferred embodiments, a user can specify a geometric constraints for the refined model, such as requiring that each of the vertices of the final refined curvilinear GD model have right angles. The resulting GD model can be used with any application requiring a GD model of an object, including not only automatic recognition and inspection applications, but also CAD/CAM applications.~~

The creation of accurate geometric description-based models of objects in a machine vision system can be performed in a computer-assisted process. A rough model of an image of an object forms the basis of the model. The model is refined through the application of machine vision tools and techniques so as to provide a model including a geometric description. The model can be used in machine vision applications that may be used, for example, to compare images of objects under inspection to the model.